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Federal Communications Commission
425 12th Street, SW
Washington, D.C., 20065

Re: RM-11831

To the Commission:

As an Extra Class amateur licensed for over 50 years, and as a communications professional with zero pecuniary interest in any of the relevant technologies, I OPPOSE the proposed RM. The deliberate obfuscations of those "selling" this nonsense are contrary to the best interests of the amateur radio operators in United States in the Americas, and the world in general. Transmitted bandwidth should be the only criterion, other than use of a published code, for data operation on amateur frequencies.

"Published" need not mean that "Joe Blow", with a 30 year old radio and a laptop be able to read all messages in real time. Rather, it must mean only that authorized stations, and/or stations with suitable equipment, must be able to access the data stream and decode it. Retention of messages by relay (automatic or manual) stations affords sufficient additional protection against the (pretended) National Security risks.

There should be no requirement that unreasonably and unnecessarily constrains development of new modes, protocols, and methods of digital (or analog) communication that can enhance accuracy, speed, and/or intelligibility while reducing required time of use of a frequency. To require that we go back to the "horse and buggy" (e.g., TOR, RTTY) or the "Model A" (Packet), is contrary to the very spirit of experimentation and innovation set forth in Part 97.

Protocols must be adaptive, in order to efficiently trade off speed (and, preferably, bandwidth) versus error rate in a never ending "dance" with ever changing channel conditions. To do that, the receiving station must continuously monitor quality of reception and inform the sending station to "throttle up" or "throttle down" – meaning to change symbol rate, modulation complexity, interleaving (i.e., redundancy), and bandwidth to most efficiently utilize the channel. This allows maximum data transfer in minimum time – meaning that it allows others to use the channel in the shortest amount of time.

Is it possible to create a system so that every "non-involved" receiver can effectively monitor and decode every transmission?

No. The realities of High Frequency communications more often than not allow only one of the stations to be heard by the non-involved receiver.

The transmitting station, as a part of the negotiation between it and the receiving station, normally sends a "set up" block to confirm the signal quality report/mode instruction from the receiver. If a non-involved station has the necessary equipment, the data stream can be decoded.

The "Red Herring" shouted by those opposed to practically all modern digital communications on the amateur bands is supposed "encryption" of data. The use of standard compression algorithms is most certainly not encryption, and the claims to the contrary are, at best, misinformed. As the inventor of the basic protocol that later became known (in watered down format) as G-TOR, I can attest that Modified Huffman (MH) compression has been used on the ham bands since the early 90's – with no complaints from anyone.

Compression allows fewer bits of data to be used to send a message, thus lowering the time of channel occupancy, and allowing other stations to get onto the same channel more quickly than if we use no compression. Of course, if one intercepts a compressed data stream, and does not have the equipment to recognize and decode the compression to restore the "plain" text or data, one cannot "read" the message.

Because messages are automatically retained as plain text / plain image at each sending and relay point, any nefarious activity would be exposed to the light of day. Frankly, after years dealing with national government level secrecy, only a rank amateur "spy" would consider using amateur radio. Even those would most certainly not use messages that would be opened to plain text or image at each receiving/relay point.

In the 21st century, must we constrain ourselves to mid-20th century technology in order to satisfy those who choose not to acquire the knowledge to correctly decode messages? Does this actually serve the experimental and innovative needs of our nation? We need to eliminate – not add to -- the restrictions that have prevented amateur experimentation. Experimentation will produce even more spectrally efficient and robust protocols.

As the designer of G-TOR, and of tactical modems that remain in use with military and intelligence organizations around the world, I have real world experience with trade-offs between bandwidth, modulation complexity, and symbol rates – all of which could/should be selected based upon a measure of link quality. Different types of messaging may be best served by different "classes" of protocols and modulations – but in the modern world, a single modem system unit may support many protocols and modulation schemes.

By allowing maximum flexibility, the amateur community and/or vendors may develop a modem (i.e., system unit) that may adapt (or be adapted) to select a protocol and modulation that is efficient both in terms of bandwidth and time on the air for each type of messaging (i.e., point to single point, point to multi-point, semi-autonomous interconnected system, …). The methodology that is "best" is not the same for all of these, as high rate/high bandwidth may allow short transmissions – but if repeats are necessary, the time on air balloons rapidly. Conversely, a lower bandwidth/lower rate protocol and modulation will be on air for a longer period, but may not require repeats. In cases of "selective fading" (multipath), a narrow bandwidth actually destroys our ability to use in-band diversity – which means that we will require repeats and will have increased time on air.

BACKGROUND: I am a full member of IEEE who has held all classes up to and including First Class Radiotelephone and Extra Class Amateur, was elected to Active Grade in Society of Motion Picture and Television Engineers for pioneering work in development and deployment of the first minicam systems, and spent seven years traveling the world with a cryptographic equipment manufacturer (as Senior Field Engineer and Product Development Engineer, among other titles). In that "life" I made our crypto equipment work on every conceivable type of HF/VHF/UHF radio, telephone, and satellite system used by military and diplomatic users in 40 countries.

Respectfully submitted,

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